UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/942,220	08/29/2001	Michael J. Berman	5201-24700	6921

7590 06/19/2003

Sandeep Jaggi
MS D-106
1551 McCarthy Blvd.
Milpitas, CA 95035

EXAMINER
NGUYEN, DANNY

ART UNIT	PAPER NUMBER
2836	

DATE MAILED: 06/19/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/942,220	BERMAN ET AL.	
	Examiner	Art Unit	
	Danny Nguyen	2836	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 April 2003* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,6-15 and 18-22* is/are rejected.

7)☒ Claim(s) *2, 3, 5,16 and 17* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☒ The proposed drawing correction filed on *07 April 2003* is: a)☒ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Drawings

1. The corrected drawings are accepted.

2. The applicant's arguments are moot in light of the new grounds of rejections.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1, 6-15, 18-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Collins et al (USPN 5,684,669) in view of Howald et al. (USPN 6,125,025).

Regarding to claim 1, Collins et al. disclose a system comprises a chuck (122) equipped with a lifting mechanism (136) wherein the chuck is dimensioned to receive the wafer (118) and the lift mechanism is adapted to release the wafer from the chuck; a voltage source (102) operably coupled to the chuck and adapted to impart an electronic charge to the chuck and opposite electronic charge to the wafer, producing an electrostatic attraction between the wafer and the chuck (see col. 7, lines 23-33); a sensor adapted to measure a force due to the electrostatic attraction, wherein the force is in opposition to an applied force provided by the lifting mechanism (a force gauge attached to the lifting mechanism, see col. 8, lines 20-23) ; and control system (a computer control system 100 applies a reverse polarity chucking voltage to the wafer and the chuck, see col. 7, lines 21-32) adapted to neutralize the electrostatic attraction

between the wafer and the chuck by reversing a polarity of the voltage source, thereby reducing the electronic charge to the chuck and the opposite electric charge to the wafer until the force due to the electrostatic attraction reaches a predetermined minimum as indicated by the sensor (col. 8, lines 14-54, also see the flow chart shown in fig. 2). Collins et al. do not disclose a current monitor for measuring a current proportional to the applied lifting force. Howald et al. disclose a current monitor (61) for measuring a current proportional to the applied force (col. 12 and 13, lines 57-5). It would have been obvious to one having skill in the art at the time the invention was made to modify the circuitry of Collins et al. with a current monitor circuit as taught by Howald et al. in order to control the force applied during processing the workpiece (Howald et al., col. 1, lines 1-5).

Regarding to claims 6, 13, 15, 18, Collins et al. disclose the lifting mechanism comprises at least one extendable lifting pin (134) driven by a pneumatic or hydraulic pressure actuated piston (a pneumatic lift mechanism 136).

Regarding to claims 7,14, 19, 20 Collins et al. disclose the sensor comprises a pressure sensor (flow rate monitor within the gas supply device 131) adapted to measure equivalent to force opposing the lifting mechanism and to forward the measured pressure to the control system (100), (see col. 8, lines 14-39).

Regarding to claim 8, Collins et al. disclose the control system further limits the pressure to the piston until the pressure opposing the extensible lifting pin reaches a minimum, and then to increase the pressure to the piston to enable the lifting mechanism to raise the wafer off the chuck (see col. 8, lines 15-43).

Regarding to claims 9, 10, 21, 22, Collins et al. disclose the sensor (the flow gas monitor within the gas supply device 131) comprises an orifice (130) at an interface between the wafer (118) and the chuck (122) operably coupled to the chuck are a line (an interface line between the computer control system and cooling gas supply) through which pressure may be applied to the wafer through the orifice; and a sensor (a gas flow monitor attached inside the computer control system, see col. 8, lines 25-27) adapted to indicate to the control system the presence or absence of pressure at the orifice.

Regarding to claim 11, Collins et al. disclose a method for releasing a semiconductor wafer (see fig. 1) comprises sensing electrostatic attraction between a wafer and a chuck electrically charged opposite one another (see col. 7, lines 21-34); neutralizing the electrostatic attraction by reversing the charge applied to the wafer and the chuck (see col. 1, lines 18-21); and when the sensed electrostatic attraction achieves a predetermined minimum, lifting the wafer from the chuck (see col. 8, lines 48-51, and see fig. 4, at step 216). Collins et al. do not disclose the step of measuring a current proportional to the applied lifting force. Howald et al. disclose measuring a current proportional to the applied force (by current monitor 61) (col. 12 and 13, lines 57-5). It would have been obvious to one having skill in the art at the time the invention was made to modify the circuitry of Collins et al. with a current monitor circuit as taught by Howald et al. in order to control the force applied during processing the workpiece (Howald et al., col. 1, lines 1-5).

Regarding to claim 12, Collins et al. disclose placing the wafer on the chuck (operated by robot arm, see col. 7, lines 6-7); charging the wafer and the chuck opposite one another (see col. 7, lines 20-28).

Allowable Subject Matter

4. Claims 2, 3, 5, 16-17 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

Claims 2 and 16 recite the system and method for processing the semiconductor wafer comprises the measured current from the solenoid needed to oppose a downward force of the wafer against the extendable pin prior to lifting the wafer.

The references of record do not teach or suggest the aforementioned limitation, nor would it be obvious to modify those references to include such limitation.

Conclusion

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Danny Nguyen whose telephone number is (703)-305-5988. The examiner can normally be reached on Mon to Fri 8:00 AM to 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Sircus can be reached on (703)-308-3119. The fax phone numbers for the organization where this application or proceeding is assigned are (703)-872-9318 for regular communications and (703)-872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)-308-0956.

DN

DN
June 16, 2003

GREGORY J. TOATLEY, JR.
PRIMARY EXAMINER